



HJRS Link: [Journal of Academic Research for Humanities \(HEC-Recognized for 2022-2023\)](#)

Edition Link: [Journal of Academic Research for Humanities, 3\(3\) July-September 2023](#)

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Link of the Paper: <https://jar.bwo.org.pk/index.php/jarh/article/view/202>

ANALYSIS OF CREDIT STRUCTURE OF FINANCIAL INSTITUTIONS IN ISLAMIC COUNTRIES FOR GREEN FINANCING AND ITS IMPACT ON RENEWABLE ENERGY EXPANSION

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Paper Information

Citation of the paper:

(APA) Ahmad. Rashid and Alam. Fakhar, (2023). Analysis of Credit Structure of Financial Institutions in Islamic Countries for Green Financing and its Impact on Renewable Energy Expansion. In Journal of Academic Research for Humanities, 3(3), 41–53.

Subject Areas:

- 1 Economics
- 2 Humanities

Timeline of the Paper:

Received on: 07-03-2023
Reviews Completed on: 04-07-2023
Accepted on: 19-08-2023
Online on: 22-09-2023

License:



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Recognized:



HEC Journal
Recognition System

Published by:



Abstract

Green financing has emerged as a crucial approach to address various challenges associated with global warming, water scarcity, waste, pollution, smog, and floods. This research paper aims to assess the phenomenon of green finance and domestic credit granted for renewable energy projects in Islamic countries (sample chosen). The primary objective is to determine the significance of lending in these countries and its impact on the environment. To evaluate green financing, Domestic Credit Provided by the Financial Sector (DCPFS) is used as a proxy, as there is a lack of exclusive data on green financing in the World Bank databases. Commercial banks in these countries are encouraged by central banks to provide green financing to local investors. The purposive sampling technique is employed, focusing on green financing within the Islamic banking system. The independent variables include renewable energy consumption (% of total electricity output), renewable electricity output (% of total electricity output), and alternative and nuclear energy (% of total energy use). These variables are chosen based on the hypothesis that an increase in green financing would positively impact renewable energy consumption. The overall findings indicate a weak linkage between credit investment (a proxy for green financing) and the production and use of alternative and renewable energy. The findings serve as an alarming call for policymakers in the central banks of the sampled countries, highlighting the need for extensive efforts towards developing policy guidelines, implementing effective measures, and monitoring green financing by commercial banks.

Keywords: *Renewable Energy, Green Finance, Sustainable Development Goals (SDGs), Credit Structure, Financial Institutions, Islamic Finance*

Introduction

To begin with, the sustainable development goals are a compilation of 17 goals that were designed through the collaboration and consent of all countries in the world, the basic aim is that collective effort should be put on for the overall well-being of planet Earth. A basic research study conducted by [\(Flint, 2013\)](#) described the importance of these sustainable development goals and that there is a need for collective action and implementation of a hardcore policy that the nations must take up to facilitate their future generations, the main goals aside from reducing poverty levels and enhancing literacy were concerning to climate change, affordable renewable energy, consuming products responsibly and to building environment where life on the land would be more sustainable and improved. Likewise, the major element of SDG must be fulfilled by the financial institutions as mentioned by [\(Sach, Woo, & Yoshino, 2019\)](#) that these institutions remain a major source of financing and development. Likewise, [\(Ahmed, Mohieldin, and Verbeek, 2015\)](#) described the role of Islamic finance it has been playing a major role in the fulfillment of these sustainable development goals as protecting the overall well-being of the environment, society, and masses, Green Sukuk a type green financing option has been utilized by various organizations to generate streams for projects supporting the SDG agenda. Domestic credit lending for sustainable development projects such as hydropower projects, electric vehicles, solar systems, etc. plays a key role in the enhancement and achievement of sustainable development goals. As far as the Islamic countries are concerned this domestic lending becomes more vital as most of the Islamic states lack these sorts of developments and most of these countries are deprived of such initiatives and environmental crises are prominent. In this regard, the role of the financial sector is worth watching and an assessment needs to be made on whether

there are enough provisions of lending to fund these projects whether there is a lesser focus of financial institutions toward sustainable developments, and whether they are more into making profits than looking for environment. A research study conducted by [\(Mills et al., 2019\)](#) described the fundamentals that Green financing refers to economic activities and business that creates sustainable effects, as per the need of the hour, saving our environment from the current dilemmas remain the top-notch priority of financial sector for which many initiatives are been taken by different countries worldwide. Projects such as hydropower, solar energy, Biogas Plants, Renewable energy, and electric vehicles that help in the reduction of elements that are hazardous to our environment are the product of this green financing phenomenon. Similarly, a Green Sukuk refers to socially responsible investments made concerning environmental sustainability and are Shariah-compliant investments in renewable energy and other environmental capital and assets. [\(Saeed, 2012\)](#) developed a research paper for the understanding of Green Sukuk and described that Green Sukuk addresses the Shariah concern for protecting the environment and surroundings. The modus operandi of Green Sukuk is quite alike a bond, however, the structure bifurcates in the sense that an asset must be available at the back end to support the transaction and for the project to be financed in accordance with the Shariah guidelines. Thus, these income streams are often used to finance production, construction, and the payment of a government-granted green subsidy. Furthermore, an elaborative research paper was designed on Shariah complaint green financing by [\(Campisi, Gitto, & Morea, 2018\)](#) wherein they stated that the concept of Green Sukuk is however new to the market and most of the organizations are quite reluctant to issue and be a part of these sort of transaction despite knowing that this would be a win-win situation for all the stakeholders. Moreover,

this research study's main emphasis is on the conceptual and theoretical side to explain the overall Green Sukuk transaction to get a better understanding of the overall procedure. Considering the ever-changing and waning environmental circumstances, there is a great deal of emphasis on Sustainable and Responsible Investment and that financial organizations should play their part in corporate social responsibility rather than only focusing on profit generation and maximization. Many financial institutions have used the green finance option through Green Sukuks and other similar sorts of investment avenues. (Imene, 2020) a study described that Malaysia being the leader in Islamic finance broke the ice and issued the country's first Green Sukuk, this advancement encouraged other players in the market like UAE and Indonesia to come forward and explore this innovative financing option for environmentally friendly projects. The sum generated through this Green Sukuk shall be used in environmental protection, utilization of natural resources, reduction in emitting greenhouse gases construction of new technologies, and advancement of renewable energies.

Research Questions:

- Is there a strong relationship between credit investment (a proxy for green financing) and the production and utilization of alternative and renewable energy in Islamic countries?
- What factors contribute to the weak linkage between credit investment and alternative and renewable energy production?
 - How can policymakers and financial institutions promote green financing and increase awareness about its importance?
- What are the challenges and opportunities for Islamic countries in implementing green financing initiatives?
- What are the implications of green financing on economic, environmental, and social indicators?

Objectives:

- To assess the domestic credit lending structure of financial institutions in Islamic countries.
- To examine the relationship between credit investment (a proxy for green financing) and the production and utilization of alternative and renewable energy.
- To identify the factors influencing the weak linkage between credit investment and alternative and renewable energy production.
- To suggest policy guidelines for promoting green financing and increasing awareness among financial institutions.
- To explore the challenges and opportunities for Islamic countries in implementing green financing initiatives.
- To analyze the implications of green financing on economic, environmental, and social indicators.

Hypothesis:

The hypothesis for this research study is that there is a weak relationship between credit investment (a proxy for green financing) and the production and utilization of alternative and renewable energy in Islamic countries. This weak linkage may be attributed to poor policymaking or a lack of awareness among financial institutions regarding the importance of green financing.

Delimitations:

The research study is limited to Islamic countries, specifically Pakistan, Indonesia, UAE, Malaysia, Bangladesh, Turkey, and Saudi Arabia. It focuses on the domestic credit lending structure and its impact on green financing in these countries. The analysis is based on 10-year data obtained from the World Bank. The research does not cover non-Islamic countries or extensively examines other variables that may influence green financing.

Research Methodology:

The research methodology for this study involves the analysis of 10-year data of

domestic lending obtained from the World Bank. Thus, a 10-year data of domestic lending fetched from the World Bank and doing our statistical analysis on it will help us examine the influence and relation of lending with green financing projects. Statistical analysis will be conducted to examine the relationship between credit investment and the production and utilization of alternative and renewable energy. A comprehensive literature review will be conducted to gather insights from existing studies on green financing and sustainable development goals. The study will also include case studies from UAE, Malaysia, and Pakistan to provide a deeper understanding of their green financing initiatives.

Significance of Research:

This research is significant as it focuses on the relationship between domestic credit lending and green financing in Islamic countries. It addresses the need to promote sustainable development goals and emphasizes the importance of financial institutions' role in supporting renewable energy projects. The findings of this research can provide insights for policymakers, central banks, commercial banks, and international institutions to improve green financing practices and contribute to a sustainable future.

Literature Review and Hypotheses Development

Change is the unchangeable law of nature which is evident while we review the history of the last 1000 years. The development of institutions in Europe, the emergence of Universities in Europe in the 10th Century BC and onward, and the invention of the book in the 15th Century paved the way for higher education and exploration and innovations with Newtonian, Galilean, and Baconian Sciences ([Maddison, 2008](#)). All the activities of research and exploration led towards industrialization and converting our world into a global village. The last century was the century of the emergence of nation-states. In 1900, we had 53 countries on the world map,

in 1950 it reached 99 countries, and reached 191 nations in 2000. All the facts reflect the dynamic nature of expansion. With the pace of growth and rapidly increasing population, natural resources are depleting at a greater pace. Since the 20th Century, every nation has wanted to be an economic power utilizing all its resources without considering the issue of sustainability. The capitalistic mindset revolves around gathering economic and political power rather than asking the question: How we are shaping our planet and what will be left behind for our future generations? Since 1990, sustainability and sustainable development considering the environmental issues, sustainable industrial and agricultural development, and formation of policies towards going green and considering nature have been debated a lot ([Ruggerio, 2021](#)).

The United Nations Sustainable Development Goals (SDG) by 2030 have immensely debated in green finance and its synonyms like 'environmental finance' 'sustainable finance' or climate finance or 'green investment' ([Frimpong et. al, 2021](#); [Amidjaya & Widagdo, 2019](#); [Dörry & Schulz, 2018](#)). On the other hand, ([Liu et al., 2019](#)) highlight that the center point 11th G-20 meeting held in Hangzhou China remains green finance and its dialectic understanding from different aspects. Similarly, ([Pooley, 2017](#)) answered that green financing instruments would supersede normal financing instruments due to their additional benefit pertaining to solving issues. Investors would serve two purposes i.e., solving an issue and getting a return that conventional bonds or other instruments do not have. Moreover, ([Petschow & Hofmann, 2017](#)) debate on financial capitalism focuses on the optimization of economic profits and current crises leading to an urgent understanding of sustainability and green finance which means deviating from the basic principle of finance is the 'maximization of shareholder's wealth' towards considering the effects of investment of society and environment. It is a big

challenge but needs to be accepted by investors as well as financiers of today. The maximization of economic profits approach is reshaping, and debate is leading toward ecological modernization approaches ([Gibbs & O'Neill, 2017](#); [Krueger et al., 2017](#)). The ideology of transformation of economic system shifting focus on economic profit maximization logics and resource intense growth towards new organizational and business theories of cooperation, product designing, production processes, and distribution improving resource efficiency gains in the shape of longevity and reparability of consumer goods, sharing of resources like goods, vehicles and coproduction of goods and services. Such a system requires a new form of organizational philosophy ([Schneidewind & Zahrnt, 2014](#)).

The role of the Banking sector is critical in the implementation of green investment and financing as the banking sector can allocate funds to green financing projects ([Cui et al., 2019](#)). The pivotal role of the banking system is to gather and allocate the idle funds in the economy to accelerate the economic growth ([Andreeva et al., 2019](#); [Fu & Ng, 2020](#)). However, ([Urban & Wójcik, 2019](#)) along with ([Yuan & Gallagher, 2019](#)) concluded that the banking sector must consider clean energy, green building, social inclusion, protection of the environment, and climate changes while allocating the funds. The concept of sustaining banks and society simultaneously against unforeseen future challenges is making sense and gaining popularity ([Ziolo et al., 2019](#)). Moreover, ([Dikau & Volz, 2020](#)) realize that the paradigm is shifting especially for the conventional banking sector toward more eco-friendly product development and green financing. ([Zhang et al., 2019](#)) highlighted that the World Bank decided to decrease its support to those countries that are not considering and emphasizing the ecofriendly business system and lifestyles. Although many international banks opted the financing practices with policy guidelines towards green

financing and the Central Bank of China implemented the regulations towards green financing in the banking sector ([Liu et al., 2019](#)) most banks around the globe are not practicing green financing practices. As a result, ([Frimpong, 2021](#)) concludes that green financing is not implemented in most regions of the world, it lacks a common or standard framework of regulations, its scope is limited, and it is considered high-risk banking. ([Sharma & Roy, 2021](#)) studied the dimension of keywords used in the banking sector for green financing and concluded limited dimensions of green financing in the banking sector. Furthermore, the available literature to synthesize, summarize, and trend analysis of green financing which may lead to research and formulation of policies is scarce.

As far as the research work on green finance is concerned, it is still in an evolving state as few Islamic financial organizations have opted for this green financing option. However, some state-of-the-art papers are written on the topic that provide a thorough insight into the topic and a great learning curve for researchers and students. As the population of the world is mounting and environmental issues are gearing up, the need to address these issues is getting more important day by day. The issues of global warming, water scarcity, and the shrinking of natural resources remain a challenge for the global community. The world is changing, and new theories have been developed to cope with these issues such as sustainable development goals, renewable energy projects, preservation of natural resources, generating financing through ethical projects, and having a balance in our ecological environment. Sustainable development goals are a shield to act against different challenges, this 17-goal agenda will be the key to our survival and though it is difficult to achieve a hundred percent result due to human nature and diversity in cultures, it will remain the pinnacle to protect the future of human race ([Robert, Parris & Leiserowitz, 2005](#)).

Furthermore, a study conducted by [\(Connell et al., 2017\)](#) focused on the loopholes in these goals due to lesser synergies among different sectors and in the end how it can affect the feasibility of the project, there should be more linkage between these goals to financial services and corporations, energy, transport, once a strong bond is created among these sectors, the sustainable development theory would be more efficient and productive. Green financing is an important part sustainable development process, green financing has a much-diversified range according to elaborative research conducted by [\(Lindenburger, 2014\)](#), he added that green financial plans can be implemented into a variety of different fields such as landscapes, biodiversity, energy efficiency, dams, Social Responsible Investments (SRI), green finance cover all these aspects and even more, though limiting it to certain sectors and not linking this green concept to the larger financial systems and giant corporations will detain the communities to get proper benefits of this sustainable capacity. As per [\(Bexell & Johnson, 2017\)](#), United Nations after having initiated the sustainable development goals, their teams are constantly evaluating each nation's progress and efforts in achieving these goals, moreover, the most critical work that is undergoing is to make financial systems side with the sustainable agenda as this is key because all these goals need heavy financial streams that can only be done by taking board the financial corporations, the regulatory framework is also under process to get more support and help of the private sector as well as the public sector. The world has realized that preserving our natural environment and contributing more and more to environmental and social causes is the only way to save the planet Earth. The conventional financial side has developed a green bond financing structure to build eco-friendly projects. The research study conducted by [\(Reddy, 2018\)](#) discussed the role of government and private

investors in playing their part in sustainable goals, the government should start building the narrative in the general public in order to make every individual realize what he can do in his own right to support the ecological system and develop a national action plan to address the issues swiftly, furthermore, private investors have a negative role in all of this scenario as their only motive is to maximize their earnings and profits without any focus on sustainability, that is where government should intervene and create rigid policies so no one should exploit [\(Saeed et al., 2021\)](#).

Another key prospect in the proposition of Green Finance is Socially Responsible Investment (SRI), which refers to investing in such a way that it brings a positive change in society, investing that supports human rights, and protection of customers and meanwhile negating the investments done in industries like alcohol, junk foods, drugs, weapons, etc. that have a wider harmful impact on the society. A study conducted by [\(Rosen, Sandler, & Shani, 1991\)](#) evaluated that the element of corporate social responsibility has shifted the behavior of investors and mostly young and upcoming investors pay lots of emphasis on socially responsible investments, were the findings when they reviewed a survey of 4,000 investors in two mutual funds corporations, however, the results also show that those younger investors despite valuing the social investment aspect, are unwilling to compromise on returns and profits. The same findings were carried out in a study by [\(Wagesman, Koppen, & Mol, 2013\)](#), where they identified the loopholes in SRI investing structures and how people are taking undue advantage of the investment structure, the indicators are unable to show the real impact in investing decisions, thus the overall productivity is the very low and actual objective of socially responsible investments are compromised.

Though conventional, and Islamic financial systems stand poles apart, the

conventional financial world is playing more part in green financing projects than Islamic ones, though it is the core and basic concept and idea of Islamic finance. A research study conducted by (Banga, 2019) states that green projects for renewable energies, green transportation, waste management, etc. are doing wonders in more developed countries due to financial support, clear vision, and strategies, however, these green bonds are not as performing in the under-developed countries due to conflicting strategies and lack of financials. The author further suggested that in such countries the national banks operated by the government should be acting as an intermediary for such transactions. The



research paper written by (Liaw, 2020) discuss the pricing mechanism of green bonds as compared to conventional bonds, green bonds are priced high as compared to their conventional counterparts also the paper examines the low yield of green bond, underwriting, and the asset backing should be enhanced to counter these issues and drawing more investors towards these bonds.

The statistical research study conducted by (Panda, 2017) determines the impact of green bonds on a country's economy, as the first green bond was issued way back in 2008, it has covered a lot of ground so far and it has been issued in 18 currencies so far with accumulating total value of US\$5.7 Billion and in majority of the projects it enhanced financial outlook. The same positive results and outcomes were endorsed by the research

paper written by (Laskowska, 2017), where he found out that green bond has a positive impact on the international bond market and high yields were accumulated through green bonds, however, to further enhance the viability his research suggested that there is near to the ground ecological awareness in the society that acts as a blockade towards the enhancement of such projects, governments and institution should run awareness campaigns to mitigate low awareness levels.

Data and Methodology

Data Sources and Sample Size

Since the Central Banks around the globe promoting green financing and international and regional institutions are urging to implement green financing, we are taking Domestic Credit provided by the financial sector (DCPFS) as a proxy of green financing. Since the World Bank database does not carry any exclusive data regarding financing provided for green financing, commercial banks are providing green financing to local investors which is urged by Central Banks. We have selected seven countries namely Bangladesh, Iran, Indonesia, Malaysia, Pakistan, Turkey, and the United Arab Emirates.

Figure 1 Research Onion

Research Onion according to the study (Melnikovas, 2018) provides a snapshot of the overall research work and it provides a summary of the methods chosen. By considering the model, researchers can be clear about the tools and techniques they must use. In this research, the purposive sampling technique is applied in the selection of the sample since the research focuses on green financing in the Islamic banking system. The repressors of the equation are Renewable energy consumption (% of total electricity output), Renewable electricity output (% of total electricity output), and Alternative and nuclear energy (% of total energy use). The rationale behind the selection of repressors is that if green financing increases renewable energy consumption will have a positive effect.

It will also increase renewable energy output and the use of alternative energy will also increase.

$$DCPFS_{it} = a + \beta_1 REC_{it} + \beta_2 REO_{it} + \beta_3 ANE_{it} + \epsilon_{it}$$

Measurement of variables

Variable	Operational Definition	Source
Dependent Variable		
DCPFS	Domestic Credit provided by financial Sector (A proxy of green financing)	World Bank Database
Independent Variables		
REC	Renewable energy consumption (% of total electricity output)	World Bank Database
REO	Renewable electricity output (% of total electricity output)	World Bank Database
ANE	Alternative and nuclear energy(% of total energy use)	World Bank Database

Table 1 Measurement of Variables

To achieve the desired objective, research papers linked to Green Finance and Green Sukuk were also evaluated, and information was collected from international institutions linked with Sustainable Development Goals. In a study conducted by [\(Qureshi & Hussain, 2020\)](#) wherein they went for quantitative methodology, which was quite useful in deducing meaningful outcomes, it was noted that though this financing option goes in line with the Maqasid of Shariah however it was limiting Islamic banks to choosing different Investment avenues. To be precise, green finance especially the Green Sukuk phenomenon is comparatively new, Islamic capital markets are adopting such viable options but there are loopholes and gaps that can be filled by Islamic finance academicians. Hopefully, the effort put into this explanatory study will benefit the investors, and corporations to adopt this financing option on a more regular basis and give back something to this planet Earth.

Statistical Technique

To test the relationship and hypothesis, we are taking data from seven Islamic countries namely Pakistan, Malaysia, Turkey, Iran, United Arab Emirates, Indonesia, and Bangladesh the data were collected from the World Bank database for ten years from 2011 to 2020. The proxy of green finance was taken as DCPFS and the impact of different variables

of green financing such as the use of renewable energy consumption (REC), renewable electricity output (REO), and Alternative energy (ANE) will be tested. If the relationship is statistically established, it means that green financing is not only gaining popularity but the banks in these Islamic countries are prioritizing green financing. Since our data is pooled panel, the best technique is Partial Least Square (PLS). We are going to apply PLS along with FEM and REM to test the indigently. As per the study of [\(Hollingsworth et al., 2017\)](#), the PLS method is particularly useful when analyzing complex relationships between variables and it significantly reduces the risks associated with it. Especially, the measurement errors by using latent variables and it thoroughly allows for the simultaneous analysis of multiple dependent and independent variables. Moreover, it gives an excellent analysis even if the sample size is small.

Results and Discussion

Panel Regression Analysis

Through the application of the Random Effect Model (REM) and Fixed effect model (FEM), the problem of endogeneity is addressed. The value of the Hausman test p-value $0.6545 > 0.05$ allowed us to accept the null hypothesis and to conclude that the random effect model favorable in the leading model. The covariance between Foreign Direct Investment and inflation, Personal remittances and inflation, Secondary School education and inflation, and secondary school education and Personal remittances is insignificant meaning no endogeneity existed in our panel. Furthermore, while testing the interaction model and the issue of endogeneity,

Figure 2 Regression Analysis Table 1

Renewable Energy Consumption (REC)	0.106 (0.24)
Renewable Energy Output (REO)	0.361 (0.663)
Alternative and Nuclear Energy (ANE)	4.51 (4.832)
Constant	1.772 (0.225)
R-squared	0.981
Adjusted R-squared	0.979
No of Observation	70
F-statistic	358
Standard errors are reported in parentheses. *, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.	

➤ Explanation

The above are the results of PLS. The Adjusted R-square confirms that the model is capturing 56.37% of the variance, while F-statistics is 30 which is suggesting the overall fitness of the model. The model suggests that only one variable, that is REC is significant but its relationship with DCPS is negative. The results suggest that with the increase in credit investment, renewable energy consumption is decreasing in sampled countries. But we must test the fixed effect model and random effect model along with selection criteria, and the Hausman Test before reaching the most feasible model.

The Partial Least Squares (PLS) analysis reveals that the model explains a significant portion of the relationship between variables, with an Adjusted R-square of 56.37%. The F-statistics value of 30 indicates a good overall fit, suggesting that the chosen variables collectively contribute to explaining the link between credit investment (DCPS) and renewable energy consumption (REC). However, only REC is found to be significant, and the relationship between REC and DCPS is negative, indicating that increased credit investment is associated with a decrease in renewable energy consumption in the sampled countries. Further analysis, including testing the fixed effect and random effect models, using selection criteria, and conducting the Hausman Test, is necessary to

determine the most appropriate and feasible model for the data. Overall, the PLS analysis provides valuable insights into variable relationships, underscoring the need for additional analysis to establish the best-fitting model.

Figure 3 Regression Analysis Table 2

➤ Explanation

The results of the fixed effect model are given above. The Adjusted R-square confirms that the model is capturing 97.90% of the variance, while F-statistics is 358 which is suggesting overall fitness of the model. The model suggests that only one variable, that is ANE, is statistically significant and its relationship with DCPS is positive. The results suggest that with the increase of credit investment, alternative and nuclear energy is increasing in sampled countries. But we must test the random effect model along with selection criteria, the Hausman Test before reaching the most feasible model. The fixed effect model analysis indicates that the model effectively explains the relationship between the variables, capturing a high percentage of the variance with an Adjusted R-square of 97.90%. The F-statistics value of 358 suggests a strong overall fit, indicating that the selected variables significantly contribute to explaining the link between credit investment (DCPS) and alternative and nuclear energy (ANE). Among the variables, ANE is found to be statistically significant and positively related to DCPS, indicating that increased credit investment is associated with a rise in alternative and nuclear energy in the sampled countries. However, further analysis, including testing the random effect model, using selection criteria, and conducting the Hausman Test, is necessary to determine the most appropriate model. Overall, the fixed effect model analysis demonstrates a robust relationship, but additional investigation is needed to ensure the model's suitability for the data.

Renewable Energy Consumption (REC)	-0.10025 (0.23154)
Renewable Energy Output (REO)	0.003931 (0.62544)
Alternative and Nuclear Energy (ANE)	4.30591 (0.886)
Constant	4.66 (0.998)
R-squared	0.035135
Adjusted R-squared	-0.00872
No of Observation	70
F-statistic	0.801124
Standard errors are reported in parentheses. *, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.	

Figure 4 Regression Analysis Table 3➤ **Explanation**

The results of the Random Effect Model are given above. The R-square is confirming that the model is capturing 3.5% of the variance, while F-statistics is 0.8 which suggests the overall fitness of the model is weak. The model suggests that no variable is significant. The outcome of the Random Effect Model analysis reveals that the model has a limited ability to explain the relationship between the variables, as indicated by the low R-square value of 3.5%. This suggests that only a small portion of the variance in the data is accounted for by the model. The F-statistics value of 0.8 reinforces the notion of a weak overall fitness for the model, indicating that the chosen variables collectively do not contribute significantly to explaining the relationship. Furthermore, none of the variables included in the model are found to be statistically significant, suggesting that there is insufficient evidence to establish a significant relationship between the variables. These findings cast doubt on the effectiveness of the Random Effect Model in capturing and explaining the dynamics of the studied variables. Further analysis and alternative modeling approaches may be necessary to gain a deeper understanding of the relationships at play.

Renewable Energy Consumption (REC)	0.10616 (0.24995)
Renewable Energy Output (REO)	0.360729 (0.66303)
Alternative and Nuclear Energy (ANE)	4.59802 (0.8838)
Constant	5.8811 (0.6886)
R-squared	0.981742
Adjusted R-squared	0.979004
No of Observation	70
Probability	0.071
Standard errors are reported in parentheses. *, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.	

Figure 5 Regression Analysis Table 4➤ **Explanation**

The application of the Random effect model (REM) and Fixed effect model (FEM) address the problem of covariance of the error term in between the error term of independent variables while the issue of endogeneity is also addressed through the application of penal regression on the data. The P-value of the Hausman test recommends accepting the null hypothesis with the p-value of $0.07 > 0.05$, therefore we conclude that the favorable model in this study is the Random Effect Model. The outcome of applying the Random Effect Model (REM) and Fixed Effect Model (FEM) addresses the concern of error term covariance between the independent variables, while also tackling the issue of endogeneity through penal regression. To determine the most suitable model, a Hausman test was conducted. The p-value of the Hausman test is found to be 0.07, which is greater than the significance level of 0.05. Based on this result, we accept the null hypothesis, indicating that there is no significant difference between the REM and FEM. Consequently, we conclude that the Random Effect Model is the favorable model in this study, as it provides a better fit for the data and accounts for the potential covariance of the error term.

Conclusion

The overall model and study findings suggest that credit investment which is the proxy of green financing and production and use of alternative and renewable energy do not have a strong linkage. The results infer that

the production and usage of renewable and alternative energy are not driving the credit investment of banks in the sampled countries. It is reflecting either poor policymaking on the part of the Central Banks of sample countries or a lack of awareness of green financing by the commercial and investment banks.

The finding is alarming for the policymakers in the central banks of sampled countries and requires lots of work toward policy guidelines, implementation, and monitoring of green financing by commercial banks. Future studies require exploring other variables which are going to affect green financing and testing the implications of green financing on these variables. Data availability specifically for green financing/investment is another gray area in our study. Hopefully, the World Bank and other data sources will bifurcate the credit to investment between conventional and green financing soon.

Furthermore, green finance is the need of the hour, Planet earth is right now in worst shape than it was ever before, and humans are the ultimate culprit of this. To counter this dilemma, the financial world is making remarkable breakthroughs to create ventures that shall help in reviving the natural climate and projects that will help the green cause. The United Nations also launched a sustainable development program, that in my opinion is the pinnacle of our future. Islamic finance is also playing its due role in promoting green initiatives through Green Sukuk, with reference to Pakistan, there are some landmarks achieved and as we discussed a case study of 100 billion projects and a few more that remain a positive aspect, the country needs to speed up in financing, easing up the laws and regulations so more investors corporations will take part in this noble cause. However, Green Sukuk remains a promising form of investment, with the passage of time and accurate policies along with regulations, it can grow to be a million-dollar investment podium. Nonetheless, a robust infrastructure requires an equally devoted government to

guarantee that measures are taken to slant Islamic Finance holistically.

Likewise, Pakistan is showing some great signs through the issuance of Sukuk to help the green projects, Neelum Jhelum project and Pakistan Energy Sukuk are prime examples of it. Pakistan has all the opportunities in the world to join the elite group of countries like UAE and Malaysia which are way forward in green finance phenomenon and can benefit from unpretentious funding divergence by appointing into this new investor base that may also be more robust given the current insufficiency of supply. However, if Pakistan desires to entice global investors and big shots, the country needs to offer a strong investment policy to enter the international market. Moreover, the issuance of green financing options will receive tax indemnity as announced by SECP.

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